Chapter 7 : Datacasting

Technology Description

Datacasting is an important element of the all-new "push technology" of the new millennium. It refers to the integration and wide delivery of data from a digital or analog transmission system. Raw data consisting of multimedia-media, programs, newspapers, magazines, news, entertainment, art, graphics, alert and real time control systems are multiplexed together as part of an Internet or MPEG payload. The information is transmitted over fiber, terrestrial and satellite networks. Considered by some to be the "Third Golden Age of Television", datacasting will play some part in our lives in the future. Information delivered across the world in seconds versus getting information hours or even days later, will have astounding impact on worldwide communications.

At AFRTS-BC, different types of data are processed, multiplexed, and transmitted to both of the International satellite networks, SATNET, (C-Band and Ku-Band), and DTS (DTS Pacific and the DTS Indian/Atlantic). The daily delivery of "Stripes Lite", the electronic version of "Stars and Stripes" newspaper is one example.

AFRTS International PowerVu Datacasting Capabilities

To completely understand how PowerVu works, you should carefully review Chapter 4 of this Handbook. The Scientific Atlanta PowerVu compression system, as explained in Chapter 4, comes complete with external data integration and extraction capabilities. External sources of data are combined into the MPEG-2 Aggregate bit stream directly at the Multiplexer where it is processed and fed to the modulator for worldwide transmission. PowerVu serves as a "direct pipe" or connection to all IRD's (Integrated Receiver Decoders), which are tuned to a channel, which contains the data information. In other words, the data payload in PowerVu is transparent to whatever you connect to each end. See figure 7-1.
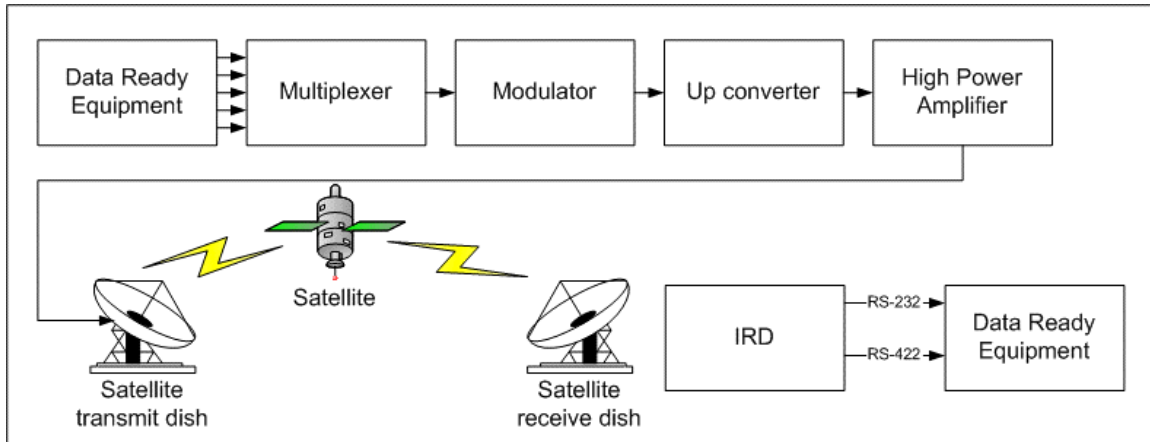
Figure 7-1 PowerVu Datacasting

The PowerVu compression system accepts two different types of data protocols for worldwide transmission; RS-422, Synchronous data for high-speed (data rates up to 2.048 Mbps), and RS-232, Asynchronous data for low speed (data rates up to 38.4 Kbps). Each PowerVu Network Multiplexer will accept up to two RS-422 inputs and four RS-232 inputs. It should be noted that PowerVu is limited to implementing this data by the number of bits/bandwidth available in each compression system. Once the data is supplied to the Multiplexer for worldwide transmission, properly configured virtual channels allow customers to access this data by connecting personal computers, printers and other data compatible equipment to the IRD data connectors located on the rear panel.

A serial printer such as an Epson FX-750 (or suitable substitutes with input buffer) can be connected to any one of a number of serial RS-232 connections. "Category 3", or better communication network cables are recommended to be used as part of this connection. Cable lengths should not exceed 100 feet without the aid of an amplifier or repeater. (some locations claim normal operation with lengths up to 250 feet with "Category 5" network cable).

The RS-232 transmission link is considered to be a DTE, (data terminal equipment) to DCE, (data circuit terminating equipment) connection. In other words, the Demultiplexer is a DCE on the "output" side. See Figure 7-2.
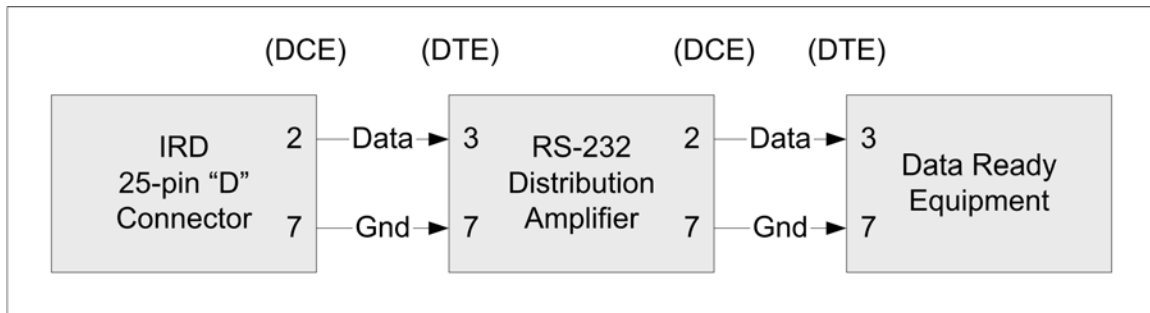
Figure 7-2 PowerVu IRD RS-232 wiring

Most, if not all PC serial input ports are configured as DTE; printers should be double-checked for a DTE or DCE connection. This is extremely important, because DTE and DCE connections are "reverse wired" in relation to each other

64 Kbps High Speed Data Channel

The 64 Kbps high-speed data channel is currently configured and available on SATNET virtual channels 1, 3, 4, and 25. On the AFN Europe satellite signal, the data channel is configured on virtual channel 21 for Hotbird 4. (see appendix A for Virtual Channel Guide information). This high-speed data channel feeds AFN Broadcast Stations and Network Affiliates with a wide variety of data. Utilizing a Data Comm for Business SR-8 Demultiplexer, this channel currently provides:

- AIN (Affiliated Information Network program notes)

- News Wire (announcements and news from AP News, ABC, NBC, CBS, CNN, ESPN, Sports and other immediate news stories as they are released from North America.)

- Television and Radio Network Alert messages messages

- Television and Radio Network Alert messages (NAS) PA system announcements, One way communication from the AFRTS-BC to announce satellite outages and other important types of information.

All of this information is used by television and radio programmers, directors and chief engineers to assist in planning, editing, and loading program material and directing the operation of Radio and Television stations around the world.

The extra audio channel, which provides Network Alert announcements to AFRTS affiliate stations is an add-on modification provided by AFRTS-BC. (Contact the AFRTS Engineering department for more information)

The DCB SR-8 statistical Demultiplexer actually extracts data from a single RS-422 composite network link out of a Scientific Atlanta Power-Vu IRD and feeds up to eight RS-232 asynchronous terminal devices or an 8 channel Rocket Port for integration into the "NewsBoss Network". Asynchronous terminal devices may be dumb terminals, printers, plotters, and serial computer ports from PC computers via RS-232 DA's if desired.

Basic Set-up

There are two possible methods in which Affiliates can configure their stations for reception of this data channel. Stations can use either/or a combination of methods based upon individual configuration requirements. AFRTS-BC is currently using a combination of both methods. The first method A, utilizes standard VT-100 dumb terminals, PC's configured with VT-100 terminal emulation (HyperTerminal) and/or serial printers. The preferred method B, utilizes Desktop Technologies NewsBoss wire capture system. NewsBoss workstations run on Windows 95/98/2000 or Windows NT 4.0. Standard off the shelf PC based hardware can be used with the installed NewsBoss software (Pentium 200 minimum). NewsBoss Wires is a highly sophisticated wire capture and communications module that receives data from up to 8 RS-232 serial ports via the Rocket port. The system is scalable and has many configuration options. Using TCP/IP protocol the workstation can be connected to the affiliates LAN or WAN. This will enable you to feed the signal to Radio, Engineering, Network Control Center (NCC), Traffic, Network Operations, etc.

Features of NewsBoss include:

- Receives data automatically from up to 8 RS-232 sources using the rocket port.

- Sorts data by category (AIN, NAS, News, Sports, etc.).

- Enables notification of urgent and priority data via the screen or external alarm.

- TCP/IP connectivity to LAN or WAN.

- Modem capability for dial-up services.

- Simple to set-up and customize.

Equipment Requirements

To receive data off the SATNET C-Band 64 Kbps channel, you will need the following minimum equipment as part of your satellite reception configuration:

Method 1

- 1ea Scientific Atlanta models 9223 803-201, or 9223 803-311, or 9223 803-313 IRD.

- 1 each Data Comm SR-8 demultiplexer with product manual.

- 3 each VT-100 dumb terminal and/or standard 286 PC or higher end model with available serial port (One unit is dedicated for the network management port, which the engineers will control and configure).

- 3 each Standard computer monitor and/or 3 each serial printers.

- VGA monitor (not needed if using dumb terminals).

- Data Com for Business (DCB) remote voice card (for voice card option).

- DCB SA-1 speaker amplifier (for voice card option).

- Speaker and power amplifier (for voice card option).

- Associated cables.

Method 2

- 1 each Scientific Atlanta models 9223 803-201, or 9223 803-311 IRD.

- 1 each Data Comm for Business SR-8 Data demultiplexer with product manual

- NewsBoss Workstation – Minimum Configuration requirements include Pentium 200 or above, 64 MB RAM, 4.3 GB IDE Hard Drive, Windows 95/98/2000 or Windows NT 4.0 Workstation, network interface card (NIC), SoundBlaster SB-16 or better audio card, 15 inch SVGA monitor, ZIP or JAZ backup drive.

- NewsBoss Software package:

    - Newsboss First Work Station (software), 1 each, Part # 808-5239, $2136.00
    - Software Maintenance Agreement 1-3 Workstations, 3 years, Part #978-7213-360, $982.00
    - Rocket port PCI-8 fast multi-port serial adapter, 1 each, 808-9157, $295.00
    Available from: Broadcast Electronics (BE), 4100 N. 24th St., Quincy, Ill., 62301 (217) 224-4700

- 1 each VT-100 dumb terminal and/or standard 286 PC with available serial port (for the network management port).

- 1 each Standard VGA computer monitor (Monitor not needed if using dumb terminals).

- Data Com remote voice card (for voice card option).

- Data Com SA-1 speaker amplifier (for voice card option).

- Speaker and power amplifier (for voice card option).

- Associated cables.

Depending on each Affiliates Engineering and Operational requirements, the network for receiving this channel can be expanded to serve multiple workstations and monitoring terminals. An extensive news network can be configured, however this should be consider to be part of a new "Broadcast LAN" which is totally separated and not connected to the IT LAN used for e-mail and other types of administration for security.

Multiplexer Configuration

The DCB SR-8 data concentrator (statistical multiplexer) is used to combine up to eight asynchronous terminal devices to communicate through a single composite or network link. Asynchronous terminal devices may be dumb terminals, printers, plotters, serial computer ports, etc. Each data port is

configured individually, with network speeds up to 19.2 Kbps (RS-232). The SR multiplexer also controls the data flow to and from each terminal device. These individually configured flow control parameters may be either software controlled (Xon/Xoff) or hardware controlled through the RS-232-D interface.

CBD (Hardware,CTS/RTS) Flow

The network management port allows the engineers to configure, set-up, obtain information, reconfigure and troubleshoot the SR-8. Multiplexer configuration is set through the rear panel "network management" port using a dumb terminal or PC with available serial port.

Multiplexer configurations are kept in non-volatile memory. Refer to DCB manual pages 5-3 to 5-14 for command and configuration port settings.

There are two ways to access the network management port. The first method described is recommended:

1. Connect the supplied six-foot cable to the SR network management port connector on the SR-8 and then to an asynchronous terminal. The cable has a RJ45 8-position connector, which attaches to the SR-8 and a DB-25/9 pin connector that attaches to the computer. Check pin wiring to ensure correct connections. (see Figure 7-6)

2. Use the terminal connected to port 1 as the network management access: Depress the port 1 setup switch on the front panel. The port 1 setup indicator light will turn on. To return data port 1 too normal data activity, depress the switch again.

When using the supplied network management port cable for direct connection to the network management port, the terminal should be configured for:

- 9600 bps
- 8 Data bits
- No Parity
- 1 Stop bit
- XON/XOFF

When mapping the network management port to Port 1, make sure the terminal parity and speed settings match the settings for Port 1. Factory defaults are

- 9600 bps
- 7 Data bits
- Space Parity
- 1 Stop bit
- XON/XOFF

Each synchronous port on the SR-8 should be set-up as follows

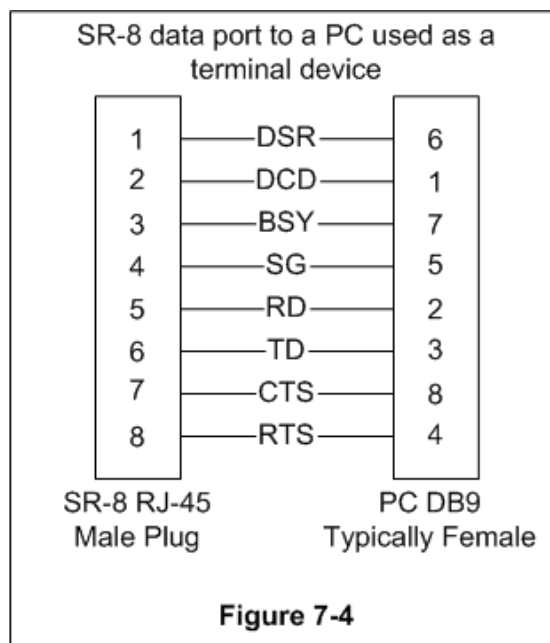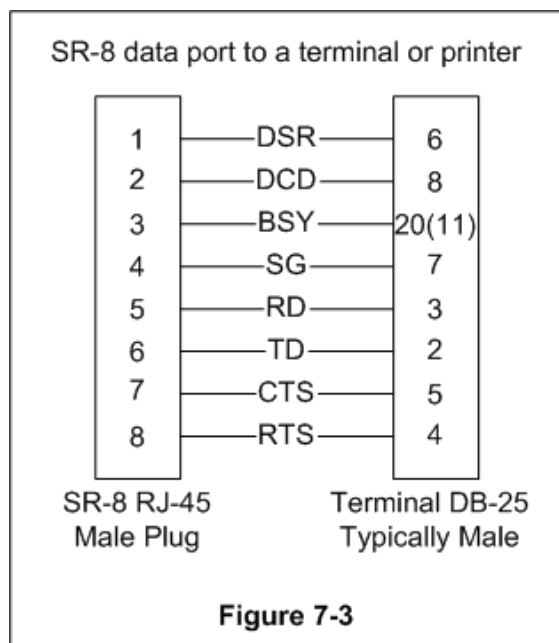| Asynchronous Port Specifications		
Data Format	1 start bit	
	8 data bits	
	1 stop bit	
Port Rates	Channel 1 AIN/News Wires	9600 bps
	Channel 2 (reserved for future use)	Not used
	Channel 3 NAS Data	9600 bps
	Channel 5-8 (reserved for future use)	Not used
Port interface	RS-232-D	
Port Connectors	RJ45, 8-position female (jack)	
Port Flow Control	CBD (Hardware, CTS/RTS)	

SR demultiplexers are designed to operate in normal office environments using standard 120 VAC power. For optimum performance, the following steps are recommended:

1. Make sure you use the power supply shipped with SR.

2. Place the SR in a location with sufficient airflow and clearance for cooling.

3. Place the SR in a location where the controls are easy to access and the indicators may be seen.

4. Place the SR in a secure position so the weight of the power supply and attached cables don't cause the unit to fall.

5. Plug the power supply into a grounded 120 VAC outlet. The outlet should be isolated from electrical equipment, which draws large amounts of current such as large electrical motors. You should consider installing UPS or surge protection.

6. Avoid placing the SR in environments where temperatures may be extremely hot or cold

Network loopback and individual port options are set through the network management port. (Refer to Section 5 of DCB manual for management port information).

Flow control options are the most critical and the most common source of installation problems. If the flow control is improperly implemented no data or data loss will occur. If you are using software flow control (Xon/Xoff) double-check the parity settings. Make sure that the parity is set the same at the CPU, remote SR and attached devices. See Section 3.2 of the DCB manual for Xon/Xoff parity setting information. Also see Section 9 for complete flow control information.

Cabling between the de-multiplexer and the computer ports or terminal devices is another common source of installation problems. Installers should carefully review section 6 of the DCB manual for proper cabling and connector pin-outs. The most common cable interfaces are illustrated in the following four figures.

SR-8 data port to a terminal or printer		SR-8 data port to a PC used as a terminal device	
1 —DSR— 6		1 —DSR— 6	
2 —DCD— 8		2 —DCD— 1	
3 —BSY— 20(11)		3 —BSY— 7	
4 —SG— 7		4 —SG— 5	
5 —RD— 3		5 —RD— 2	
6 —TD— 2		6 —TD— 3	
7 —CTS— 5		7 —CTS— 8	
8 —RTS— 4		8 —RTS— 4	
SR-8 RJ-45 Male Plug	Terminal DB-25 Typically Male	SR-8 RJ-45 Male Plug	PC DB9 Typically Female
Figure 7-3		**Figure 7-4**	

Figure 7-3 SR-8 connection to a printer and Figure 7-4 SR-8 connection to a PC terminal device
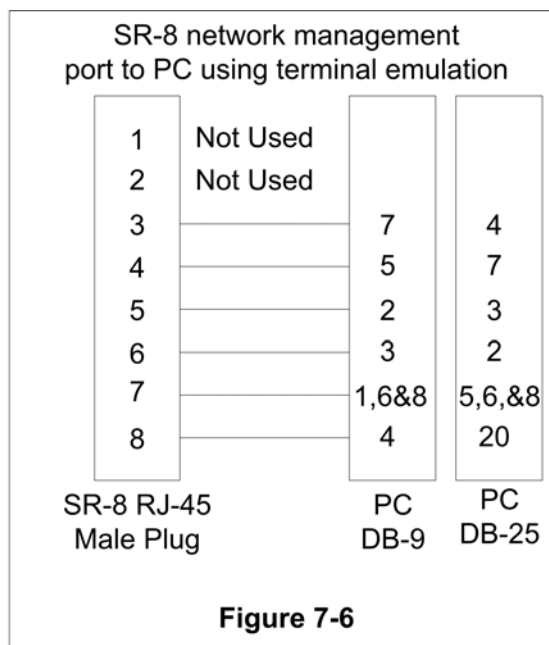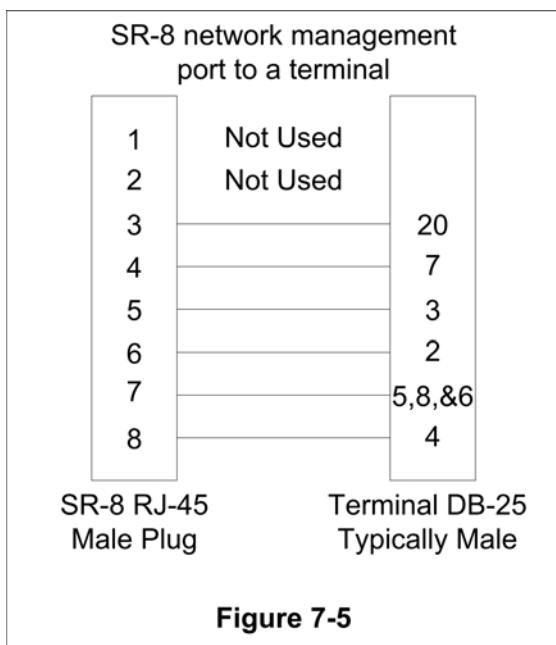
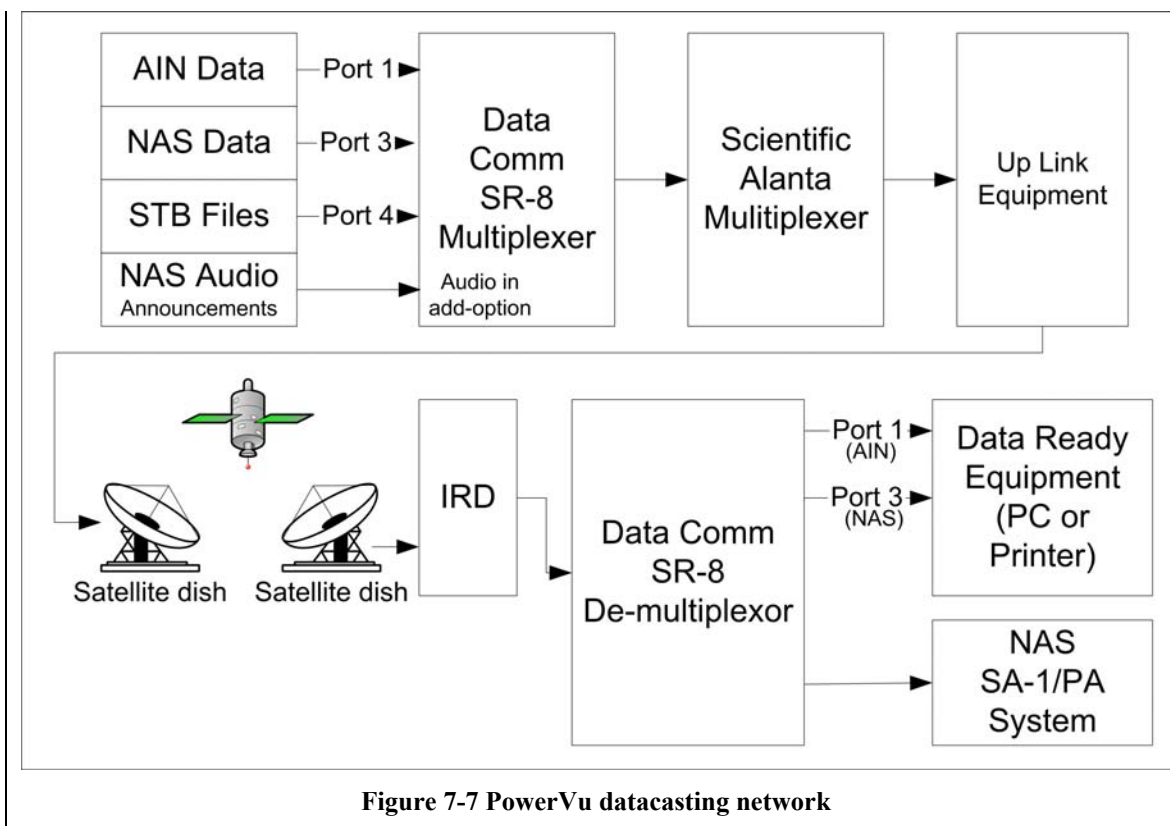**Figure 7-5 SR-8 network management port to a terminal and**

Figure 7-6 SR-8 network management port to a PC terminal

The SR-8 Multiplexer operates in several different modes determined by switch selections and the state of critical RS-232-D leads.

Loopback Mode - This mode is activated by switch selection or through the network management port control. In loopback, the SR loops back any signals received to the originating source. Loopback is bi-directional.

On-Line Multiplexing - This is the normal mode of operation where all ports are active.

Off-Line – This mode exists when position 3 (DCD) is negative on the composite channel connector.

Figure 7-7 PowerVu datacasting network

Quick Set-up Procedures

1. Once the SR-8 multiplexer is installed in the proper location, connect the supplied six-foot network management cable from the SR-8 network management port to the PC serial port (using terminal emulation or Dumb Terminal). Be sure to check cables for proper pin continuity based on what type of equipment you are using. (Figures 7-6) "Category 5" communication network cables are required to be used as part of this connection. Cable lengths should not exceed 100 feet without the aid of a repeater.

2. Connect the supplied 9 pin to RJ45 adapter to the 9 pin "high speed" data port on Scientific Atlanta model 9223 803-201, or 9223 803-311 IRD. Connect a "straight through" CAT05 (RJ45 to RJ45) cable from the above-mentioned adapter to the composite input port on the back of the SR8 Demultiplexer. (See figure 7-8)

Figure 7-8 SR-8 wiring

3.)Open "HyperTerminal" (standard on Windows 95/98/2000) or your favorite communications software. Check and modify (if necessary) the terminal or PC parity and speed settings as previously described (9600, 8, None, 1, XON\XOFF).

4.) Hit the escape key twice – fast. You should see one of the menus displayed.

5.) Type "MR1", press enter.   (Monitor Receive Port 1, AIN/News wires)

6.) You should now receive perfect data text on the network management port. (If all settings were set)

7.) Connect from output port 1 on the SR8 to your PC and/or printer to receive AIN and News Wires, output port 3 to receive the NAS Alert messages. If you do not have the "NewsBoss" software, running standard Hyper term software (standard on Windows 95/98/2000) can be used receive the data from the SR-8's Output ports, 1-8. (See Table 7-1 for pin-out wiring)

PIN	SIGNAL	PIN	SIGNAL
1	RS-422+	6	RS-422-
2	Clock Out+	7	Clock Out-
3	Reserved	8	Reserved
4	N/C	9	N/C
5	Signal Gnd		
Table 7-1 64 Kbps high-speed pin-out			

Figure 7-9 is the transmit adapter from the DCB SR-8 data concentrator to the Scientific Atlanta multiplexer (transmit uplink sites only)
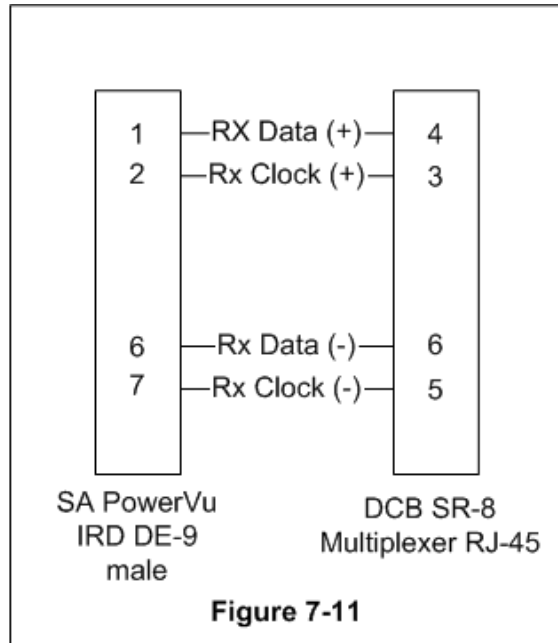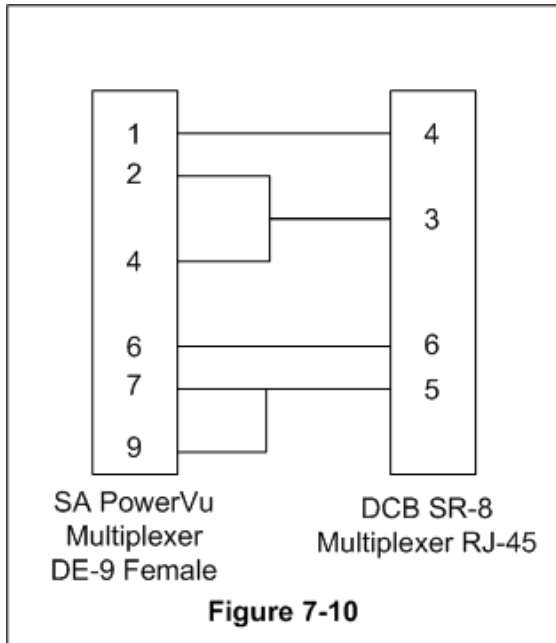
Figure 7-9 PowerVu Multiplexer to SR-8 and Figure 7-10 PowerVu IRD to SR-8

Connect from output port 1 on the SR8 to your PC and/or printer to receive AIN and NewsBoss, output port 3 to receive the NAS Alert messages. If you do not have the "NewsBoss" software, running standard Hypertermal software (standard on Windows 95/98/2000) can be used receive the data from the SR-8's Output ports, 1-8. (See Figure 7-11)
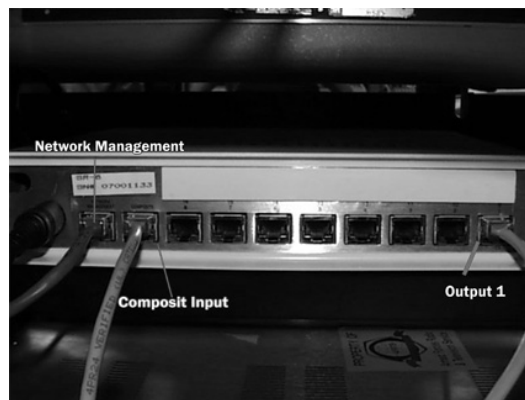
Figure 7-11 SR-8 output ports

SR-8 Commands

The following commands can be entered into the HyperTerminal session established with an SR8 data multiplexer. Windows HyperTerminal should be set to 9600-baud, 8 data bits, no parity, 1 stop bit, and XON\XOFF flow control. After establishing the session with the SR-8 hit the escape key twice quickly to bring up the system prompt "AT YOUR COMMAND>>". Commands are listed in table 7-2, test tool commands are located in table 7-3.

Command	Key Strokes
Show Network	SN
Show Configuration	SC
Show Voice	SV
Change Port Configurations	CP
Change Mux Parameters	CO
Change Voice	CV
Change Voice Rate	CR
Configure Modem	CM
Configure Network	CN
Set ID	ID
Activity Counters/Zero	AC/Z
Flow Control	FC
Test Tools (see other table below)	TT
Type	TY
Repeat Last Command	*
Disconnect Network Management Port	BYE
Table 7-2 SR menu commands	

Test Tool Command	Key Stokes
Capture Port	CA#
Network Loop/Quit	NL/QNL
Monitor Port TX	MT#
Monitor Port RX	MR#
Network Management Port Parity	P
Reset Mux	RESET
# = port number	
Table 7-3 Test Tool Commands	

SR-8 Setup

The data channels one though 8 should all be set to loop-off, flow control to CNB (CTS No Busy), and the data rate to 9600-baud. Audio settings can be found in table 7-4.

Parameter	Setting
RX Gain	0 dB
TX Gain	0 dB
Voice Onlevel	-40 dBm
Voice Offlevel	-43 dBm
Voice on holdover	200 msec.
Noise insert	Off
Voice rate	6400-baud
Voice jitter delay	100 msec.
Voice Port	1 (E&M)
Table 7-4 SR-8 voice channel settings	

1.544 Mbps High Speed Data Channel

The 1.544 Mbps RS-422 high-speed data channel provides worldwide customers with "Stars and Stripes" newspaper publishing material. This information is downloaded edited and inserted into the existing publication, which is distributed to thousands of our military, civilians, and families overseas from Europe and the Far East. CD AudioVault WAV files are also combined into this channel to provide AFRTS affiliates with needed music and news The 1.544 Mbps data channel is configured on SATNET channels 10, 11, and 24. (See appendix A).

Configuration

To receive the SATNET C-Band 1.544 Mbps data channel, you will need the following equipment as part of the your satellite reception configuration;

1) Scientific Atlanta model 9223 803-201, or 9223 803-311 IRD

2) Pentium 233 MHz ISA or faster personal computer w/ mouse

3) Video Playback Card (required for MPEG-I and/or 2)

4) 3.2 Gb HD or larger

5) 64 Mbytes or more RAM

6) 15 inch or larger SVGA Computer Monitor

7) Associated cables

8) Operators installation manual

9) Windows NT Workstation 4.0 or Windows 95

10) Fazzt Remote Station Software

11) Fazzt Data Workstation module, FZT/HSCC96-RX

12) Fazzt Type B PowerVu cable

13) Fazzt Users and installation manual

14) Adobe Acrobat Reader, Microsoft Internet Explorer, Office Suite or a Microsoft Excel viewer.

Computer technicians and engineers should refer to the personal computer and Fazzt users manual for specific installation guidelines. Figure 7-12 depicts the system's block level configuration.
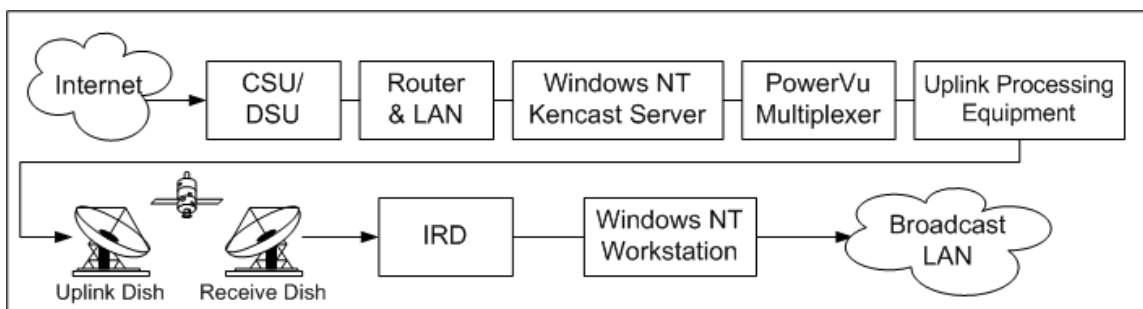
Figure 7-12 Fazzt network

Cabling and Pin outs

"Category 5" communication network cables are required to be used as part of this connection. Cable lengths should not exceed 100 feet without the aid of a Ethernet repeater. Figure 7-13 shows the IRD 1.544 Mbps high speed 9-pin D-connector and Fazzt Type B, RS-422 cable pin-outs that are connected to the computer.
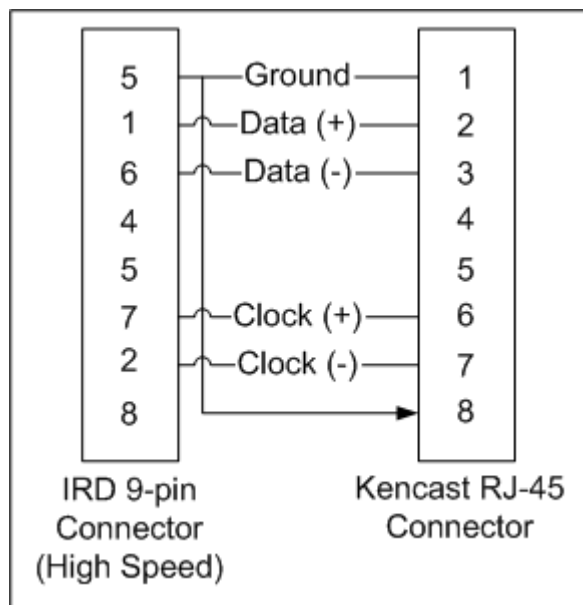

Figure 7-13 IRD to Kencast connection

Datacasting on DTS (128 Kbps High Speed Data Channel)

The DTS 128 Kbps, RS-422 high-speed data channel is an information highway of multimedia-media, programs, newspapers, news, entertainment, art, and graphics supporting a worldwide audience. Utilizing a technology from Kencast called Fazzt, this payload consists of daily transmissions of Stripes Lite, Navy News Wire, Early Bird, Weather Charts, satellite photos and charts. Originated from various locations around the country, the data is imported into a Windows NT Fazzt Server where the data is prepared and processed for worldwide transmission. On the receive side, a Pentium II computer is connected to the IRD where files are automatically placed in a created directory "C:\Hot Folder". (The Kencast Fazzt software automatically creates this folder) The 128 Kbps data is currently configured on DTS Pacific virtual channels 201 and 202; DTS Indian Atlantic virtual channels 301 & 302 (see Chapter 3).

Configuration

To receive the DTS 128 Kbps data channel, you will need the following equipment as part of the your satellite reception configuration;

1) Scientific Atlanta model 9223 803-201, or the 9223 803-311 IRD

2) Pentium 233 MHz ISA or EISA microcomputer with mouse

3) Video Playback Card (required for MPEG-I and/or 2)

4) 3.2 Gb HD or larger

5) 64 Mbytes or more RAM

6) 15 inch or better SVGA Computer Monitor

7) Associated cables

8) Operators installation manual

9) Windows NT Workstation 4.0 or Windows 95

10) Fazzt Remote Station Software

11) Fazzt Data Workstation module, FZT/HSCC96-RX

12) Fazzt Type B PowerVu cable

13) Fazzt Users and installation manual

Computer technicians and engineers should refer to the personal computer and Fazzt users manual for specific installation guidelines. Figure 7-14 depicts the system's block level configuration.
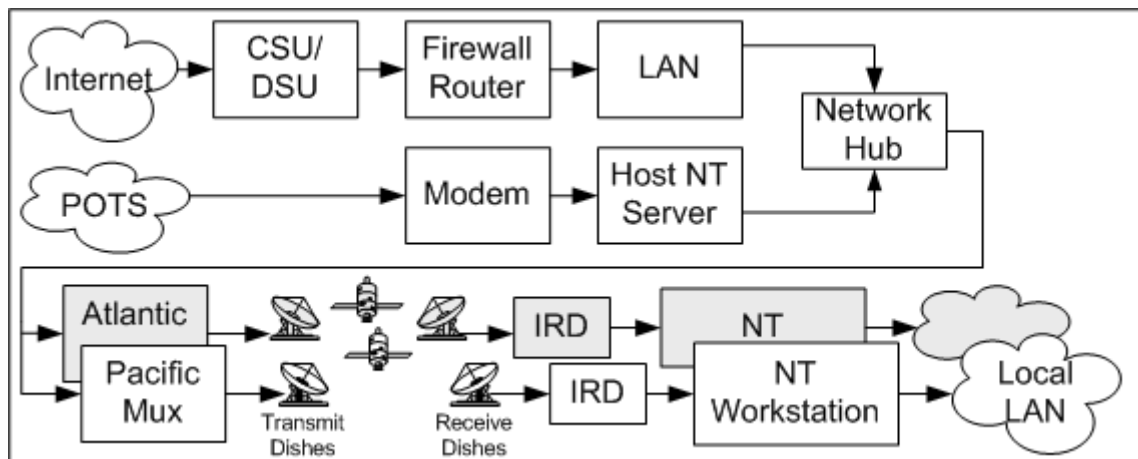

Figure 7-14 Fazzt configuration and interface.

Cabling and Pin outs

"Category 5" communication network cables are required to be used as part of this connection. Cable lengths should not exceed 100 feet without the aid of a repeater. Previous Figure 7-11 shows the IRD 128 Kbps high-speed 9-pin D connector and Fazzt Type B, RS-422 cable pin-outs that are connected to the computer.

1.544 Mbps and 128 Kbps High Speed Data Troubleshooting Guide

The following troubleshooting steps are provided assuming the installer has carefully reviewed associated installation and users guide material provided with each piece of equipment and has checked ALL cables for continuity to include opens/shorts between pins/wires. The installer should have also re-checked cables for a snug and tight fit.

1) The IRD is locked on the satellite signal; a steady green light on front panel is present (not flashing).

- YES – proceed on to next step

- NO – Refer to Chapter 4, IRD Troubleshooting Guide

2) The IRD is tuned to the right channel, referring to the virtual channel guide for your particular satellite region network located in appendix A. This can be confirmed on the model 9223 803-200, 201, 202, 204 by pushing the "Menu" button, and the then pushing "0" to display all services. If you are on the right channel, you will see an entry for HSD (high-speed data) . The model D9234 can be checked by using the remote control, by pushing "Menu", "Satellite Services", and then "Select".

- YES – proceed on to next paragraph

- NO – Change to the correct channel

3) Most Fazzt installation problems stem from an incorrect configuration. The most common cause of installation problems is a conflict in Interrupts (IRQ). You must make sure that Fazzt's IRQ selection is compatible with your computer. The setting must be unique. If any other device in your computer is set for the same IRQ as the Fazzt Card, it will not work.

This is likely an interrupt problem: You have an interrupt conflict if your computer locks up when you try to launch the Fazzt High Speed Receiver. Another sign of interrupt conflict is unusual behavior such as receiving only part of the data being transmitted (or none at all). The default IRQ is 12.

Solution: From the Windows Program Manager/Desktop, launch the Fazzt High Speed Receiver. Double click on the gears icon to launch the Fazzt Configuration Utility. Select another IRQ. Then try again to launch the Fazzt program. Repeat these steps, trying to find a different IRQ (11, 10, 9 etc…).

4) Make sure the Fazzt Card is well seated in the expansion slot being used.

5) Try the Fazzt Card in a different ISA slot.

6) Make sure that your port is configured for the correct address.

This is likely port problem: You may have a port problem if, when you launch the Fazzt Configuration Utility, you get the error message "Bimodal Interrupt Service Not Available". If you are running under Windows NT, you can confirm that the problem is with the port by rebooting the system; then launching the "Event Viewer" in Windows "Administrative Tools" program group. If it registers a System Error "Device not detected in specified port", you have a port problem. If you are running Windows 95, perform the solution steps anyway.

Solution: Remove the Fazzt Card from your PC and inspect the jumper straps. (See Fazzt Installation Step III discussion and diagram of port settings.) If the Fazzt Card has a port setting other than the default 0x120 the easiest way to remedy the inconsistency is to change the software port setting using the Fazzt Configuration Utility, to the same settings as the card. Replace the card in the slot and launch the Fazzt Configuration Utility by double clicking on the gears icon in the Fazzt High Receiver module. Alternatively, you can change the jumper straps on the card to another configuration. Try this if the 0x120 setting does not work.

IRD Control and Polling from a Remote Location

Scientific Atlanta model IRD's can be checked and controlled from remote locations. Connect a desktop or laptop computer using a modem and telephone line. See figure 7-15.

Figure 7-15 IRD control via a PC

Connect a standard category 3 (or 5) network cable between the modem and the IRD's expansion port utilizing the following pin-outs for single or dual IRD polling configurations. See figures 7-16 and 7-17.
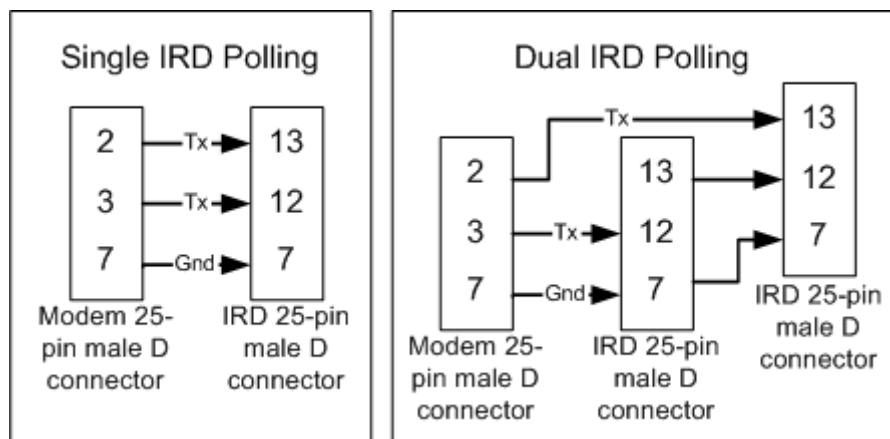

Figure 7-16 Single IRD polling and Figure 7-17 Dual IRD polling

Use a simple communication program like Windows HyperTerminal to control and poll the remote IRD from your computer. Listed in table 7-2 are some of the commands recognized by the IRD.

Table 7-5 IRD polling commands

SA1BER	Displays current Bit Error Rate (IRD#1)
SA1CCP	Displays current CCP software version
SA1DCP	Displays current DCP software version
SA1VER	Displays type of decoder
SA1CE	Displays current corrected errors
SA1UE	Displays current uncorrected errors
SA1CE=0	Resets currents corrected errors to "0"
SA1UE=0	Resets current uncorrected errors to "0"
SA1INST	Displays all current configuration data on the IRD
SA1PW=OFF	Turns Power "off" on IRD
SA1PW=ON	Turns Power "on"
SA1QLTY	Displays current signal quality
SA1AGC	Displays current signal strength
SA1CH=1	Changes the IRD to channel One
To poll the #2 IRD in a dual poll configuration use SA2BER command.	